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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/607,106

06/25/2003

Yung-Soo Kim

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66547

7590

10/09/2008

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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

10/09/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/607,106	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> Kevin M. Burd	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 7 is/are rejected.
- 7) ☒ Claim(s) 2-6 and 8-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

1. This office action, in response to the remarks filed 7/11/2008, is a final office action.

### ***Response to Arguments***

2. Applicant's arguments filed 7/11/2008 have been fully considered but they are not persuasive. Applicant states the previously cited references do not disclose the estimating multiple access interferences representing an extent to which reception signals for other users at the same time interfere with the reception signal for a desired user. The examiner disagrees. The previous office action discloses this limitation. Fuller, in figure 3, shows user signals are input to multiple access interference (MAI) subtraction block 66. Paragraph 0083 states for the first user, the signals for the second, third and fourth users are subtracted from the input signal to form an estimate for the individual signal for the first user. Therefore, the second, third and fourth user signals are multiple access interfering signals that interfere with the recovery of the first user signal. The second, third, and fourth user signals are estimated so these interfering signals can be used to cancel interference on the input signal and allow the first user signal to be recovered. For this reason and the reasons stated in the previous office action, the rejection of the claims is maintained and stated below.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al (US 2003/0095590) in view of Vihriala (US 2002/0045433) further in view of Nangia et al (US 7,139,237).

Regarding claims 1 and 7, Fuller discloses an apparatus and method of estimating multiple access interference and recovering user data as shown in figure 3. The receiver of figure 3 receives an input signal that is composed of four user signals separated by orthogonal codes in a CDMA system. The input signal is stored and then separated into four individual signals corresponding to each of the user signals. The signals are demodulated and weighted (paragraph 0038). The weighted signals for each of the four user signals are sent to the regenerate function 74 which will spread, scramble and filter the user signals. The regenerated signals for the second, third and fourth users are subtracted from the stored composite input signal to form an estimate of the individual signal for the first user. New representations of the individual signals are generated in a similar fashion for the second, third and fourth users (paragraph 0039). These user signals are feedback to block 66A and used for the next iteration in the receiver. The functions are repeated a number of times and the output of the last iteration is used to form the final symbol decisions from the each of the four individual signals (paragraph 0040). The second, third and fourth users act as interference on the first user in the received signal and these signals are estimated and processed and then subtracted from the input signal to determine the first user signal.

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Fuller does not disclose calculating a frequency offset of the input signal and compensating for that frequency offset. Vihriala discloses an apparatus and method for estimating the frequency offset from a received signal. Vihriala discloses a complex phasor is generated for compensating the frequency offset. The frequency compensation can be made before or after the channel estimation thus producing feedback compensation (paragraph 0013). The circuitry for generating the complex phasor for compensating the frequency offset is shown in figures 5 and 6. The frequency offset is estimated from the channel estimate (paragraph 0013 and figure 5). The correction of frequency offset in the receiver increases the accuracy of the channel estimate and increases performance (paragraph 0008). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the method and apparatus of Vihriala into the receiver of Fuller. The combination is directed for use in a CDMA communication system. The combination does not disclose applying the method and apparatus to an interleaved frequency division multiple access (IFDMA) communication system. Nangia discloses a multi-rate multi-user IFDMA communication system (abstract). Nangia further discloses other multiple access protocols such as code division multiple access (CDMA) protocols can be used in conjunction with or run on top of the multi-rate IFDMA scheme described herein (column 15, lines 34-43). The combined CDMA/IFDMA scheme described will be an IFDMA system. Using multiple coding protocols will increase security of the transmitted data and the signal will be more resistant to interference. For this reason, it would have been

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obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Nangia into the combination of Fuller and Vihriala.

***Allowable Subject Matter***

4. Claims 2-6 and 8-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/  
Primary Examiner, Art Unit 2611  
10/5/2008